COMMONWEALTH of VIRGINIA

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FY 2011
Drinking Water State Revolving Funds (DWSRF)
Green Project Reserve (GPR)

DWSRF eligibility principles indicate that State programs are responsible for identifying projects that count toward GPR. The following overall general principles apply to all projects that count toward GPR.

1) All GPR projects and activities must otherwise be eligible for DWSRF funding. GPR projects and activities must meet the definition of one of the four GPR categories. The individual GPR categories do not create new funding authority beyond that described in Section 1452 of the Safe Drinking Water Act (SDWA).

2) GPR projects and activities must further the goals stated in Section 1452 of the SDWA.

3) Projects and activities that utilize the DWSRF set-asides can also be eligible for GPR. Planning and assessment activities, such as conducting water or energy audits, are eligible, as well as green-oriented capacity development, source water protection, and total/integrated water resources management planning activities. Where applicable, the pertinent set-asides that can be used are noted in the next section.

The following Business Cases were provided to Virginia Department of Health from sub-recipients receiving construction funds in support of the GPR initiative for the 2011 State Revolving Fund funding year.

These Business Cases are provided for public review without any statement of suitability for GPR funding. For additional information regarding the GPR initiative, please follow the link: http://www.epa.gov/reg3wapd/infrastructure/gpr.htm

SECTION K – GREEN RESERVE PROJECT (GRP) BUSINESS CASE

All applicants must submit a completed business case for GPR. To qualify for credit as Green Reserve Project (GRP), a waterworks must show that its proposed SRF -funded project has significant (not incidental) green benefits. The project must provide green infrastructure, promote water and/or power efficiency, or provide other innovative environmental benefits.

Applicant	Bland County Service Authority
Contact Name and Phone	Rodney L. Ratliff, Director of Public Works (276) 688-4607
Project Description and associated costs	Portions of the existing Bland County Water System do not meet the requirements set forth by the Virginia Department of Health Waterworks Regulations as stated in Section 12 VAC 5-590-690.C: "All waterworks shall provide at least a minimum working (under flow) pressure of 20 psi at the service connection based on the greater of maximum hour or maximum day plus applicable fire flows." As a result of the low system pressures, the existing fire hydrants shall be removed or bagged until the requirements set fort by the Waterworks Regulations can be satisfied. The proposed project will provide for adequate pressures throughout the system to meet the Waterworks Regulations requirements and allow for the use of the existing hydrants as well as assist in reducing the water system's total lost water. The project will consist of the installation of the following elements: 2 EA. 3 HP Pitless Booster Pump Station and all related appurtenances 2 EA. 4 Gallon Hydropneumatic Tank and Vault 115 L.F. 1-inch Water Line 335 L.F. 2-inch Water Line Requested Funding = $315,000 (See attached PER for detailed cost estimates)
What project elements can be classified as potentially green?	The water line replacement consisting of 115 L.F. 1-inch Water Line and 335 L.F. 2-inch Water Line could be classified as potentially green as the purpose of the line replacement is to help address accountability issues currently being experienced within the Bland Community Water System which has a current accountability of 61 percent. This portion of the project represents approximately 3.5% of the total requested funding or $11,000.
Technical Component	See Enclosed Water Accountability Study for the Community of Bland Water Distribution System
Financial Component	See Enclosed Water Accountability Study for the Community of Bland Water Distribution System
GPR Dollars Claimed	$ 11,000 and 3.5 % (as % of VDH funded portion of project)
Signature/Date	Rodney Ratliff 3/31/10

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Applicant	Town of Dungannon
Contact Name and Phone	Karen L. Powers, Mayor – Phone (276) 467-2522
Project Description and associated costs	1. Replace approximately 2500 LF of 8-inch waterline ($163,012) 2. Replace 240 water meters with new radio-read water meters ($93,800) 3. Execution of required non-construction services ($134,341) Refer to the attached sheets in Section K for additional information.
What project elements can be classified as potentially green?	The replacement of 100% (of the Town's existing, conventional water meters with new, radio-read devices can be classified as "Water and Energy Efficiency." (Cost = $93,800)
Technical Component	The Town's water distribution meter average age is 10 years, with the oldest meter having been in service over 20 years. Given the age of the system meters, the Town estimates that at least 18% of water goes unregistered through the service connections, resulting in lost revenue and added water treatment/delivery expense. (Estimated system-wide water loss is over 30%) A number of existing system meters present safety hazards or other hurdles (inaccessibility due to vehicles, dogs, fences; flooded meter boxes, etc.) for regular reading and processing. The provision of radio-read meters would greatly reduce or eliminate these hazards while concurrently reducing operational expenses (vehicle mileage/fuel, labor hours required). Refer to the attached sheets in Section K for additional information.
Financial Component	The deployment of radio-read water meters is anticipated to generate savings of **$12,200 annually** from labor and fuel expense. The deployment of new water meters with industry-standard accuracies is anticipated to save approximately **$2000 annually** on water production expenses. *(Note that this does not include the recaptured water revenue.)* Refer to the attached sheets in Section K for additional information.
GPR Dollars Claimed	**$14,400/annually** and **15.3%** (as % of VDH funded portion of project)
Signature/Date	

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Applicant	Town of Gate City
Contact Name and Phone	Mark V. Jenkins, Mayor – Phone (276) 386-3831
Project Description and associated costs	1. Water pump station replacement ($100,000) 2. Water storage facility ($350,000) 3. Water distribution system (lines) upgrades ($456,963) 4. Execution of required non-construction services ($284,154) Refer to the attached sheets in Section K for additional information.
What project elements can be classified as potentially green?	The water pump station replacment can be classified as "Water and Energy Efficiency." (Cost = $100,000)
Technical Component	Refer to the attached sheets in Section K for additional information.
Financial Component	The pump station replacement is anticipated to generate a savings of **$5,500 annually** in electrical power expense. The pump station replacement is anticipated to generate a savings of **$8,000 annually** in pump/motor material and labor expense. Refer to the attached sheets in Section K for additional information.
GPR Dollars Claimed	**$13,500/annually** and **13.5%** (as % of VDH funded portion of project)
Signature/Date	

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Applicant	Town of Gate City
Contact Name and Phone	Mark V. Jenkins, Mayor – Phone (276) 386-3831
Project Description and associated costs	1. WTP equipment upgrades ($561,750) 2. Replace 1221 water meters with new radio-read water meters ($399,195) 3. Execution of required non-construction services ($252,065) Refer to the attached sheets in Section K for additional information.
What project elements can be classified as potentially green?	The replacement of 100% of the Town's existing, conventional water meters with new, radio-read devices can be classified as "Water and Energy Efficiency." (Cost = $399,195) The equipment upgrades/enhancements at the Town's WTP can be classified as "Water and Energy Efficiency." (Cost = $561,750)
Technical Component	The Town's water distribution meter average age is 10 years, with the oldest meter having been in service over 20 years. Given the age of the system meters, the Town estimates that at least 15% of water goes unregistered through the service connections, resulting in lost revenue and added water treatment/delivery expense. (Estimated system-wide water loss is over 25%) A number of existing system meters present safety hazards or other hurdles (inaccessibility due to vehicles, dogs, fences; flooded meter boxes, etc.) for regular reading and processing. The provision of radio-read meters would greatly reduce or eliminate these hazards while concurrently reducing operational expenses (vehicle mileage/fuel, labor hours required). Refer to the attached sheets in Section K for additional information.
Financial Component	The equipment upgrades at the WTP is anticipated to generate a savings of **$6,745 annually** from labor, material and electrical power expense. The deployment of radio-read water meters is anticipated to generate savings of **$30,677 annually** from labor and fuel expense. The deployment of new water meters with industry-standard accuracies is anticipated to save approximately **$10,800 annually** on water production expenses. *(Note that this does not include the recaptured water revenue.)* Refer to the attached sheets in Section K for additional information.
GPR Dollars Claimed	**$48,222/annually** and 5.0% (as % of VDH funded portion of project)
Signature/Date	

Revised January 12, 2010
APPLICANT : KEYSVILLE

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Applicant	Town of Keysville, Virginia
Contact Name and Phone	James D. Ramsey , Mayor Telephone Number: (434) 736 9551
Project Description and associated costs	**Water System Improvements** **1. 100% replacement town meters - $50,000** **2. reduce potable usage by Wastewater Treatment Plant - $50,000** **3. WTP general improvements at this old facility includes repair/replace/upgrade filter rate of flow controllers, filter head loss systems, exhaust fans, and replace chemical feeders. -- $ 506,100** **4. Reservoir pretreatment improvements will provide better treated water -$30,000** **636,100**
What project elements can be classified as potentially **green?**	**From above, Elements 2, 3, and 4: Reducing potable usage at Wastewater plant, most of (85.5%)WTP repair/ replacement/ upgrades/ improvements , and reservoir compressor.** **$ 512,716** 636,100
Technical Component	WATER SAVING : In 2008 the WTP delivered about 118,997 gpd into the system. WTP improvements reduce water estimated (Raw minus Treated delivered) about 19,000 gpd Waste Treatment Plant uses about 15.5% of Town's production so reducing will save about 18,452 gpd. Overall water savings are expected to be 48,000 gpd. (40%) CHEMICAL SAVINGS: less chemicals will be needed by reducing water losses and need to run WTP ENERGY SAVINGS: less energy will be used by reducing time WTP is run and increased efficiency motors
Financial Component	1. Chemicals : reduction of 15.5% Current monthly costs $ 3,418 Savings $ 530.00 2. Improved life ; Chemical feeders $80,000 replace every 15 yrs = $445.00 monthly increase life 15.5% Savings 69.00 3. Energy : Water is pumped 3 times therefore reduction of (3)(15.5%) is 46.5%. Current monthly costs $ 2,359 Savings $ 1097.00 4. O & M : reduction of 15.5 % Current monthly cost $ 2040.0 Savings $ 316.00 TOTAL: $ 2012.00 monthly or $ 24,144 annually.
GPR Dollars Claimed	$24.144 annually and 4.7% (as % of VDH funded GREEN portion of project)
Signature/Date	Signature James D. Ramsey , Mayor DATE:

Applicant	**VDH Project No. _____** – City of Norton Water System Improvements Phase II
Contact Name and Phone	E. W. Ward, CPA, City Manager 276.679.1160 Phone ErnieW@nortonva.org 276.679.3510 Fax
Project Description & Associated Costs	The City's water distribution system consists of approximately 260,100 linear feet of 12-inch through ¾-inch waterline, five (5) water storage tanks, and four (4) booster pump station, and one (1) hydropneumatic pump station. The storage capacity of the five (5) tanks is 2.27 million gallons. In 2003, the City completed a major line replacement project throughout its service area, replacing asbestos-cement pipe. The proposed project has located many areas where lead joint cast iron waterlines have been in service for 40 to 60 years. These waterlines are currently experiencing significant breaks and leaks due to high pressures, age and deteriorated condition of the existing waterlines. In addition, there are areas of the system that do not currently meet the *Virginia Waterworks Regulations*, as areas of the water system have 2-inch waterlines and smaller. The proposed project provides for Phase II of three (3) problematic areas identified through a VDH Planning Grant. The proposed project area (Area II), waterlines along Poplar Street and Hagan Ave have continual breaks and leaks due to the age and conditions of the existing waterlines. Phase II (Area II) will replace approximately 6,050 lf of 6-inch, 1,350 lf of 4-inch, 500 lf of 2-inch and 4,000 lf of ¾-inch waterline; numerous valves; 100 service reconnections with new meters; and, associated appurtenances. Existing waterlines will be abandoned in-place upon completion of service reconnections. In addition, meters in the project area are 20 years old and will be replaced with the project. Funding is being sought elsewhere to address Areas I and III.
What project elements can be classified as potentially green?	The entire project may be considered "green," as it encompasses replacing extremely corroded/leaking galvanized line and under-reading meters. Furthermore, the reduced cross section of the galvanized line requires additional power to pump water throughout the City's service area.
Technical Component	Based on water records, system accountability is 49.31 percent, resulting in an annual water loss for the City approaching 180,000,000 gallons per year. The three (3) areas problematic identified will replace approximately 23,800 linear feet of old lead joint cast iron, asbestos-cement and galvanized line; approximately 9 percent of the system. The proposed project is will replace approximately 3 percent of the waterlines system-wide. The majority of these lines are severely corroded galvanized, with cross sections reduced in some areas to 30 percent of their original diameter. Assuming the old water meters throughout the system are under-reading by 10 percent, annual water loss due to meters (4,339 equivalent connections, with 3,360 gallons per month average consumption), water loss due to meters is approximately 17,500,000 gallons annually. Assuming the system outside of the three (3) problem areas identified is 70 percent accountable and the remainder is within the three (3) Areas, approximately 27,500,000 gallons are lost annually in Area II, the proposed project area.
Financial Component	Reduction in water loss of 27,500,000 is approximately 8.2 percent of total water produced/purchased, after accounting for under-reading meter loss. Financial benefits from the replacement of the old lines: **$39.952 Annually*** 1. 2009 water treatment chemicals cost was $60,000. A, 8.2 percent reduction in water treatment results in an annual chemical cost savings of $4,920. 2. 2009 water treatment power cost was $40,000. A 12.0 percent (pumping adjusted) reduction in water treatment results in an annual power cost savings of $4,800. 3. 2009 water treatment salaries cost, with overtime was $236,400. A 3.0 percent (adjusted) reduction in operators time results in an annual salaries savings of $7,092. 4. The 2009 annual transmission line maintenance (labor/expenses only) was $244,900; reduced by 5.0 percent (adjusted) with replacement, net annual savings is $12,245. 5. The annual short-lived assets of the WTP motors and pumps and line repair equipment are $35,301 system-wide. At an annual savings of 8.2 percent, the anticipated annual cost savings is $2,895. 6. Miscellaneous annual system-wide savings are projected at $8,000. * Annual cost savings will be applied to Phase II and other water system needs.
GPR Dollars Claimed	**$ 905,022** and **100.00%** (as a percent of the VDH funded portion of the project)
Signature / Date	 April 12, 2010 E. W. Ward, CPA, City Manager Date

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Applicant	*Washington County Service Authority*
Contact Name and Phone	*Douglas F. Canody, P.E.* *(276) 676-6767*
Project Description and associated costs	*This project could provide water to 18 existing and occupied residences not presently having access to public watery. 14 of these residences, or 78% of the project area, are committed to purchasing a connection to the WCSA water system upon completion. Residents presently rely on private wells, springs and cisterns, which are supplying dwindling quantities of water. Testing by WCSA has revealed that 40% of the samples collected from private water sources in the project area are bacteriologically contaminated. The project would also replace 2,810 feet of existing 2-inch galvanized line which is required to adequately serve the new customers and improved service for existing customers. Total project costs have been estimated at $414,829.*
What project elements can be classified as potentially green?	*The galvanized line replacement (2,810 feet) can potentially be classified as "green". The WCSA distribution system consists of approximately 900 miles (4,752,000 feet) of water line and 600,000 feet (12%)of the total is constructed of 2-inch and smaller galvanized water line. Yet 86% of the breaks and leaks fixed in the water distribution system occur on galvanized water line. The project should be considered "green" in that we proposed to replace 2,810 feet of existing galvanized water line serving 16 existing connections with new and larger pipeline. This will not only make it possible hydraulically to serve the additional customers downstream of the existing galvanized line but will improve the reliability of the service to the existing 16 customers served by the existing galvanized water line. Water quality will be improved due to the elimination of corrosion products coming from the galvanized line. The total estimated project cost is $414,829 with 35.9% of the total being devoted to galvanized line replacement.*
Technical Component	*The galvanized water line in our distribution system affects the performance of our operations in many ways. Nearly 100% of it is undersized contributing to hydraulic undercapacity and overpumping. It is corroding from the outside in. The cause of the corrosion is not the water it carries but the acidic soil environment that surrounds it. As the soil acidity varies across the county so does the extent and location of the problem pipeline. As the pipe corrodes, we have noted that it tends not to break but to leak diffusely through pinholes caused by pitted corrosion in the pipeline. Not only is reliability affected but so is hydraulic capacity as the pipeline is carrying more water than it should due to 1) increased flow rates due to friction loss and 2)the fact that the pipeline was poorly designed when installed. These facts contribute to excessive friction loss due to the abnormally high flow rates which in turn increases a) non revenue water, b) over pumping and energy loss to meet demands, c) over production to compensate for water lost through leakage, d) inefficient pumping as pump design is adversely affected such that operation during non-peak demand is not possible as well as altering the operating pumps in the inefficient bands indicated on the pump curve. Another technical component is decreased water quality. Although the pipeline is mainly corroding from the outside in, the products of corrosion; zinc, iron, manganese and others components of the galvanized pipe appear in the water and affect its aesthetic usefulness. In many cases, WCSA has installed automatic flush valves to remove the products of corrosion so that the water will be found to be less objectionable aesthetically and more palatable. These actions increase non-revenue water and exacerbate hydraulic problems but are and will remain necessary until the galvanized line is removed from our distribution system.*
Financial Component	***The following numbers are excerpted from a report prepared by Lane Engineering, Inc., dated June 2007 and entitled Washington County Service Authority, Small Galvanized Line Replacement Project, Environmental Report** *Total estimated footage of galvanized water line in WCSA distribution system -- 600,000 feet* *Total documented maintenance cost of galvanized water line - $270,000/year* *Estimated cost of lost product due to water line leakage in galvanized water line - $340,000/year* *Cost of galvanized water line maintenance-$0.45 / ft_Cost of galvanized line non revenue water $0.57* *Total estimate cost of galvanized water line O&M - $1.02 /ft excluding value of water lost in flushing and the inefficient and/or unnecessary use of electricity for distribution pumping.*
GPR Dollars Claimed	2810 ft line replacement / 7830 feet total line = 0.359 or 35.9% x $414,829 (total project cost) = **$148,872 and 35.9% (as % of VDH funded portion of project)**
Signature/Date	Jarbt Canody 3/30/2010

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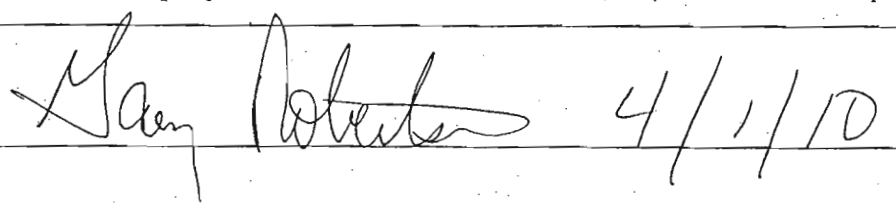
Applicant	**WESTERN VIRGINIA WATER AUTHORITY** **SALEM TURNPIKE WATER LINE REPLACEMENT**
Contact Name and Phone	Earl Smith, CIP Administrator / T 540-853-5792 F 540-853-1017
Project Description and associated costs	Replace approximately 4,648 feet of existing 12-inch 1950s era cast iron water main between 30th Street and Peters Creek Road with new 12-inch water main
What project elements can be classified as potentially green?	Water line replacement at a cost of $590,000
Technical Component	The Authority expects to **eliminate 54,237,850 gallons per year of water loss through leakage and breaks** by replacing the existing water main. The Authority's water distribution system experiences an average of 30 percent unaccounted for treated water, and the proposed water main replacement targets reducing water loss through leakage and breaks to 10 percent. The Authority's distribution system hydraulic model provided the average flow in the water main. Water Loss Through Leakage: Average flow in water main = 737,000 gal/day Current unaccounted for water percentage = 30% Current water loss through leakage = 80,756,775 gal/year Targeted unaccounted for water percentage = 10% Targeted water loss through leakage = 26,918,925 gal/year Expected water savings after project = **53,837,850 gal/year** Water Loss Through Breaks: Number of break incidents = 2 breaks/year Average treated water loss = 200,000 gal/break Current water loss through breaks = 400,000 gal/year Targeted water loss through breaks = 0 gal/year Expected water savings after project = **400,000 gal/year**
Financial Component	Using the Authority's total aggregate treatment and distribution cost of $1.64 per 1,000 gallons, eliminating 19,558,250 gallons per year of unaccounted for water would provide **awater treatment and distribution cost savings of $88,950 per year.** Chemical Cost Reduction: Current chemical cost = $0.11/1,000 gallons Chemical cost savings of **$5,966/year** Electrical Cost Reduction: Current electrical cost = $0.20/1,000 gallons Electrical cost savings of **$10,848/year** Maintenance/Labor/Ancillary Cost Reduction: Current maintenance/labor/ancillary cost = $1.33/1,000 gallons Maintenance/labor/ancillary cost savings of **$72,136/year**
GPR Dollars Claimed	**$ 88,950 per year** and **% 15.1** (as % of VDH funded portion of project)
Signature/Date	 4/1/10

SECTION K – GREEN RESERVE PROJECT (GRP) BUSINESS CASE

Applicant	VDH Project No. _____ – Woodway Water Authority Water System Improvements Phase I
Contact Name and Phone	James Shelburne, Chairman / Steve Garrett, Operations Mgr. 276.546.4148 Phone woodwaywater@comcast.net 276.546.4148 Fax
Project Description & Associated Costs	The Woodway Water Authority distribution system consists of approximately 234,000 linear feet (lf) of 16-inch through ¾-inch galvanized, cast iron, asbestos-cement, and PVC waterlines, one (1) pump station, and four (4) storage tanks. It purchases an average 130,000 gpd from the Town of Jonesville and approximately 482,000 gpd from the Town of Pennington Gap, with 223,419,000 gallons purchased annually. Water accountability is 63.59 percent. The proposed project will replace galvanized and cast iron lead joint waterlines have been in service for 40 to 50 years. These waterlines are currently experiencing significant breaks and leaks due to high pressures, age and deteriorated condition of the existing waterlines. In addition, there are areas of the system that do not currently meet the *Virginia Waterworks Regulations* for minimum pressure and flow and, connections exceeding the allowable on 2-inch waterlines and smaller. The proposed project provides for Contracts A and B, two (2) of three (3) problematic areas identified through a VDH Planning Grant. Contract A consists of line replacement throughout the Authority's service area having continual breaks and leaks due to the age and conditions of the existing waterlines. In addition, meters in the project area are 30 years old and will be replaced with the project. Contract A will replace approximately 8,750 with 8-inch, 225 lf of 8-inch river crossing, 1,200 lf of ¾-inch waterline; numerous valves; 40 service reconnections with new meters; new software for radio read meters and, associated appurtenances. Existing waterlines will be abandoned in-place upon completion of service reconnections. Contract B consists of installing four (4) hydropneumatic pump/tank systems and associated telemetry.
What project elements can be classified as potentially green?	Contract B is not considered eligible for the GPR. Therefore, the following represents the eligible project costs. • Probable Construction Cost: Entire Project $1,131,206; Hydro. Sta. <$ 551,302>; Green Project $ 579,904 • Probable Non-construction Cost: Entire Project $ 377,033; Hydro. Sta. <$ 115,913>; Green Project $ 261,120 Total Probable Cost: Entire Project $1,508,239; Hydro. Sta. <$ 667,215>; Green Project $ 841,024
Technical Component	The proposed project will replace 10,750 linear feet of old lead joint cast iron, asbestos cement and galvanized line; approximately 4.6 percent of the waterlines system-wide. The majority of these lines are severely corroded galvanized, with cross sections reduced in some areas to less than 50 percent of their original diameter. Based on water records, system accountability is 63.59 percent, resulting in an annual water loss for the Authority approaching 81,335,880 gallons per year. Assuming the system is 70 percent accountable and the remainder, approximately 20,443,000 gallons are lost annually from the lines to be replaced.
Financial Component	Reduction in waterline loss of 20,443,000 is approximately 9.1 percent of total water purchased. GRP benefits from the replacement of the old lines: **$11,314 Annually*** 1. Assuming $0.50/1,000 gallons for power, chemicals, etc. at the water treatment plants, there is a net savings of $10,216. 2. No specific data is available relative to power consumption at the pump station $12,000 annually is assumed. A pro-rata reduction in cost is $1,098. * Annual cost savings will be applied to Contract C and other water system needs.
GPR Dollars Claimed	$ 841,024 and 55.76% (as a percent of the VDH funded portion of the project)
Signature / Date	Steve Garrett April 14, 2010 James Shelburne, Chairman Date